UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,792	02/12/2002	Masaaki Hayama	MAT-6660US2	8079

7590 11/06/2003

Ratner & Prstia
P.O Box 980
Valley Forge, PA 19482

EXAMINER	
CHAMBLISS, ALONZO	
ART UNIT	PAPER NUMBER
2827	

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/074,792	HAYAMA ET AL.	
	Examiner	Art Unit	
	Alonzo Chambliss	2827	

-- The MAILING DATE of this communication appears on the cover sheet with the corresp ndence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *27 October 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/27/03 in Paper No. 9 has been entered.

Claim Objections

2. Claim 14 is objected to because of the following informalities: the word " on " is misspelled on line 7. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 13 and 15-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. In claim 13, the phrase " a second conductive pattern electrically connected by way of said via " is vague and indefinite since it is not clear what the second conductive

pattern is electrically connected to. Furthermore, how can the second pattern be electrically connected by the via when an insulation layer is formed on the via.

Response to Arguments

6. Applicant's arguments filed on 9/25/03 have been fully considered but they are not persuasive.

Applicant alleges that Hayama fails to disclose a convex via having a step and thereby having only two different widths. This argument is respectfully deemed to be unpersuasive because Hayama discloses a convex via having a configuration other than a cylindrical shape (see English translation, paragraph 45). Thus, other configuration of the convex via would yield the same result as the cylindrical shape. Therefore, one skilled in the art at the time of the invention would readily recognize from Hayama that a step configuration having only two different widths can be substituted for a cylindrical shape via, since step configuration via would provide a fine pattern shape in the plate allowing for stable electrical connection through dielectric layers for the semiconductor substrate.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 13-28, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayama et al. (JP 7-169635) in view of Saitou et al. (U.S. 5,162,240).

With respect to Claims 13 and 14, Hayama teaches a ceramic substrate 2 with a first and third pattern 35 each having convex via, being formed on the ceramic substrate 2 by a transfer printing technology through an intaglio printing using a flexible resin substance. An insulation layer 33 is formed on the first conductive pattern 35 and a second and fourth conductive pattern 32, 34 each electrically connected with the first and third conductive pattern 35, respectively by the via (see English translation, paragraphs 90-111, Figs. 8 and 10-13). Hayama discloses that it is also possible to form the pit 22 or slot 21 which has a configurations other than a cylindrical shape (see English translation, paragraphs 44 and 45. Thus, Hayama is not limited to the shape seen in the figures but can have several different shapes without departing from the scope of the invention. Hayama discloses a convex via having a configuration other than a cylindrical shape (see English translation, paragraph 45). Thus, other

configuration of the convex via would yield the same result as the cylindrical shape. Therefore, one skilled in the art at the time of the invention would readily recognize from Hayama that a step configuration having only two different widths can be substituted for a cylindrical shape via, since step configuration via would provide a fine pattern shape in the plate allowing for stable electrical connection through dielectric layers for the semiconductor substrate.

With respect to Claims 15 and 22, Hayama teaches a meshed pattern is provided in a part of the conductive pattern (see Figs. 12 and 13).

With respect to Claims 16 and 23, Hayama teaches a shield pattern (i.e. the outer most pattern of the conductive pattern 35) is provided in a part of the conductive pattern 35 (see Fig. 13). Furthermore, any pattern on the outer most pad of conductive pattern 35 serves as a shield pattern, since this pattern shields the inner conductive patterns 35 from the outside periphery of the device.

With respect to Claims 17 and 24, Hayama fails to disclose the ceramic substrate provided with a through hole filled with an electroconductive substance and burned and the via is disposed on the via is disposed on the through hole. However, Saitou discloses the ceramic substrate 11 provided with a through hole 13 filled with an electroconductive substance and burned and the via 22 is disposed on the via is disposed on the through hole (see col. 6 lines 38-68). Therefore, it would have been obvious to one skilled in the ad at the time of the invention to incorporate the substrate with a through hole with the device of Hayama, since the substrate with the through hole

would improve the electrical connection and stability between the thick substrate and a thinner insulating wiring substrate as taught by Saitou.

With respect to Claims 18 and 25, Hayama teaches a dielectric layer 33 formed on a part of the ceramic substrate 2 (see Figs. 12 and 13).

With respect to Claims 19, 20, 26, and 27, Saitou discloses a LSI chip 30 mounted o a part of second conductive pattern directly bonded to pad 23, wherein the LSI chip 30 is face down electrically connected through an electroconductive paste 32 (i.e. solder) applied o the top of a fine bump provided on the second conductive pattern. The fine bump is the portion of the electroconductive substance that protrudes passes the top portion of the insulation material 21 (see col. 8 lines 34-42, Fig. 1). Hayama discloses a fine bump formed by using a second groove 22, which is disposed on the intaglio 20 at a place corresponding to a pad of the LSI chip 30 taught by Saitou.

With respect to Claims 21 and 28, Saitou discloses an LSI package is mounted on part of the second conductive pattern face down and electrically connected through a lattice of lands with a pitch between terminals that is 220 micrometers (i.e. 200 micrometers = .2mm). The lattice is on the second conductive patterns (see col. 2 lines 1 7-25;Fig. 1).

The prior art made of record and not relied upon is cited primarily to show the product of the instant invention.

Conclusion

9. Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956

AC/November 1, 2003

Alonzo Chambliss
Patent Examiner
Art Unit 2827